of residential energy use. This forecast suggests that energy use will grow at about half its historical rate if no new government programs and policies are implemented.

3) Implementation of energy conservation programs to raise fuel prices, increase efficiency of new household equipment, and improve thermal integrity of both new and existing housing units can have significant energy impacts. A vigorous conservation program (run 12) might yield an average annual growth rate of only 0.4 percent between 1975 and 2000, with an energy use in 2000 only 10 percent higher than 1975 energy use. Implementation of these programs (run 12) would reduce energy use in 2000 from the business-as-usual case (run 6) by almost 25 percent; the reduction relative to the high case (run 1) is 40 percent. These conservation programs assume no changes in life-style on the part of American households; nor do they assume use of solar energy for any household functions.

4) Implementation of a program to increase efficiency of residential equipment by 1980, as specified in the Energy Policy and Conservation Act, can cut energy use in the year 2000 by at least 10 percent (run 8). However, additional improvements after 1980 yield considerably greater savings. Run 9 assumes that equipment efficiencies continue to improve after 1980, but at a slower rate; the energy savings in the year 2000 in run 9 are 60 percent greater than those from run 8. These results suggest the need for additional research to further improve energy efficiencies of household equipment, and the need for programs to ensure that manufacturers produce and consumers purchase increasingly efficient household equipment.

5) Programs to improve thermal integrity of residential structures can also provide significant energy savings during the next 25 years. However, the estimated savings (runs 10 and 11) for thermal improvement programs are much less than for programs affecting residential equipment and appliances—only about one-third as great. The energy savings estimated for these ASHRAE-based thermal improvement programs are much less than could be achieved for single-family units. A tough, but economically efficient, set of thermal standards for new and existing residential units could yield savings comparable to those for the equipment efficiency programs. The different dynamics of retrofit and new construction programs suggest the desirability of implementing both. A combined program would yield short-term savings due to retrofits and long-term savings due to new construction standards.

References and Notes

1. E. Hirst, W. Lin, J. Cope, *An Engineering-Economic Model of Residential Energy Use* (Oak Ridge National Laboratory, ORNL/TM-5470, May 1976).
2. ———, *Residential Energy Conservation Strategies* (Oak Ridge National Laboratory, ORNL/CON-2, September 1976).
3. ———, "Changes in retail energy prices and the Consumer Price Index," *Energy* **1** (No. 1) 33 (March 1976).
4. 94th Congress, Energy Policy and Conservation Act, PL 94-163, 22 December 1975.
5. 94th Congress, Energy Conservation and Production Act, PL 94-385, 14 August 1976.
6. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, *Energy Conservation in New Building Design, ASHRAE 90-75* (ASHRAE, New York, 1975).
7. A. D. Little, Inc., *An Impact Assessment of ASHRAE Standard 90-75, Energy Conservation in New Building Design* (A. D. Little, Cambridge, Mass., December 1975).
8. Bureau of the Census, "Projections of the Number of Households and Families: 1975 to 1990," *Current Population Reports*, Series P-25, No. 607 (U.S. Department of Commerce, Washington, D.C., 1975).
9. Bureau of the Census, *1970 Census of Housing, Detailed Housing Characteristics, United States Summary, HC (1)-B1* (U.S. Department of Commerce, Washington, D.C., 1972); 1960 and 1950 Censuses of Housing; *Annual Housing Survey: 1974, General Housing Characteristics for the United States and Regions* (Advance Report H-150-74, U.S. Department of Commerce, Washington, D.C., 1976).
10. Federal Energy Administration, *National Energy Outlook* (U.S. Government Printing Office, Washington, D.C., February 1976).
11. K. P. Anderson, "A simulation analysis of U.S. energy demand, supply, and prices," (Rand Corp., report R-1591-NSF/EPA, Santa Monica, Calif., October 1975).
12. Federal Energy Administration, "Proposed FEA regulations on energy efficiency improvement targets for appliances," *Fed. Reg.*, 41 (95), 19977 (14 May 1976).
13. Owens-Corning Fiberglas Corp., "The Arkansas Story," Report No. 1, Energy Conservation Ideas to Build On, Toledo, Ohio, March 1976.

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NEWS AND COMMENT

Cancer from Chemicals: Du Pont and Congressman in Numbers Slugfest

The Du Pont Company, which has long prided itself as a pioneer in protecting the health of its workers, now finds itself accused of deliberately obfuscating the incidence of cancer among its employees. The attack on the company's cancer statistics has been orchestrated primarily by Representative Andrew Maguire, a well-regarded young Democrat from northeastern New Jersey, who has been heading a cancer study for the subcommittee on oversight and investigation of the House Interstate and Foreign Commerce Committee. As part of that study, Maguire asked three outside experts to comment on a Du Pont cancer study that purported to find no evidence of cancer associated with the work environment. All three found fault with Du Pont's methodology and one—Michael B. Shimkin, professor of community medicine and oncology at the University of California's medical school in San Diego—issued the headline-making judgment that the Du Pont cancer registry was a deliberately misleading "public relations snow job."

In retaliation, Du Pont hired its own outside expert—Brian MacMahon, chairman of the epidemiology department at Harvard School of Public Health—to review the company's voluminous cancer data. MacMahon concluded that, while the Du Pont data does indeed have certain limitations, it may be more accurate than many other sources of cancer data. MacMahon praised Du Pont's foresight and dedication in assembling its cancer records and deplored the "derogatory tone and clear prejudice" in the attack issued by Congressman Maguire.

The fracas may not yet be over. The Du Pont Company has submitted its cancer registries to the National Cancer Institute and National Institute for Occupational Safety and Health (NIOSH) and asked for suggestions on what, if anything, should be done to improve them. (No reply has been received yet.) And

NIOSH has expressed interest in investigating the cancer situation in and around a Du Pont plant in Belle, West Virginia—an inquiry which Du Pont has pledged to assist. At this writing, it is not clear whether there is or is not a cancer problem at that particular plant. But the struggle between Du Pont and Maguire has focused attention on the problems inherent in keeping tabs on the health of workers exposed to chemicals in the modern work place.

Both antagonists in the fray seem to have solid reputations. Maguire, 37, is considered one of the brighter and more independent-minded congressmen. He was a Phi Beta Kappa graduate of Oberlin College, earned a doctorate in international relations from Harvard, held Woodrow Wilson and Danforth fellowships, and wrote a book on Tanzanian politics, which was published by the Cambridge University Press. He has been praised as an outstanding legislator by columnist Jack Anderson and consumer advocate Ralph Nader, according to his staff.

Du Pont, meanwhile, is generally considered one of the more enlightened corporations in dealing with safety and health matters. The company itself endlessly boasts about its health and safety record, backed up by statistics indicating that workers are 20 times safer at Du Pont than in their own homes. There are some skeptics. A union official at Du Pont's Belle plant testified that, while Du Pont has a good safety record in preventing finger cuts and broken toes, "they are not very careful about chemical exposure." But neutral outside observers have praised the company's performance. A recent *Wall Street Journal* article said that Du Pont's occupational health and safety program is "considered one of the best—if not the best—in industry. . . . Concern about safety and health takes on a slightly manic air at Du Pont." And even Robert S. Jackson, the Virginia epidemiologist who uncovered the Kepone poisoning scandal that led to the indictment of Allied Chemical Corp., has publicly praised Du Pont's efforts to control hazardous chemicals in his state. "There is no comparison between Du Pont and Allied," he reportedly said.

The battle over the Du Pont cancer registry occurred as a by-product of Maguire's investigation into cancer problems. The congressman and his staff became interested in cancer partly because data issued by the National Cancer Institute revealed that New Jersey was the most cancer-ridden state in the nation, and partly because they were active in the congressional push for tougher legislation to control automobile emissions and toxic substances. As the opening round in his cancer inquiry, Maguire held a hearing on 28 May in Newark, N.J.—close enough to his home district to generate headlines that might be useful in his reelection campaign. The hearing proved to be a public humiliation for Du Pont.

Du Pont employees Earl McCune (speaking) and Louis Gross (with eye patch) testify about cancer hazards at Belle, West Virginia, plant.

The lead-off witnesses were Earl McCune, safety chairman for a small union at Du Pont's Belle plant, and Louis Gross, an employee at that plant who has had an eye and a large part of his face removed because of cancer. McCune said he had put together, by word-of-mouth reports, a list of some 54 recent cancer victims at the plant, including three cases of eye cancer which seemed a "most alarming" rate for that kind of cancer. McCune complained that chemicals were everywhere in the plant and the surrounding environment in the heavily industrialized Upper Kanawha Valley. He also noted that the Belle plant dumps its effluent into the Kanawha River upstream, then draws out drinking water downstream and treats it for the use of the workers. Representative Maguire considered that an "incredible situation" of double jeopardy, where the workers are exposed to chemicals in the plant, then possibly reexposed to them in the drinking water. (The company says it treats the water, and monitors it carefully and notes that "we are all downstream to somebody" on the river.)

Du Pont originally declined to testify, but company officials who quietly attended the hearing managed to look so foolish that they had no choice but to participate. At one point Maguire and a witness discussed the fact that Du Pont had refused to appear; the Du Pont officials present uttered nary a peep. But later congressional staffers became aware of their presence and that they had offered to meet with the press during the noon break. That provoked an outburst from Maguire about executives who arrive "incognito" and sit "in the back of the room" and prefer to deal with the media rather than with a congressional committee.

Eventually a Du Pont official agreed to testify. He asserted that the company cares deeply about employee health and has been keeping cancer records since 1956. In that period of time, he said, there have actually been 144 cases of cancer among Belle plant workers, about what would be expected, he said, for individuals living in that area.

The revelation that Du Pont had long-term cancer records led Maguire to press for their release. After considerable haggling, the company reluctantly agreed to produce them. "They were very uptight about it," recalls a congressional staffer. "Everything was very tight, confidential, secret."

The company submitted hundreds of pages of documents over a period of ten weeks, including a computer printout of the entire cancer registry data, company reports analyzing the data, and a description of the methodology. The core of Du Pont's cancer tracking effort is a register that contains the names of all employees and pensioners known to have developed cancer since the program was started in 1956. Du Pont believes this is the first such register started by any American company. Morbidity data (the number of cases of illness due to cancer) are picked up primarily from claims submitted to the company's group health

insurance plan, which covers active employees only. Mortality data (deaths due to cancer) are derived primarily from claims made under the company-paid group life insurance plan, which covers pensioners as well as active employees. Neither set of data covers employees who have left the company before qualifying for a pension. And there are others who, for one reason or other, escape the health and life insurance net.

Du Pont statisticians evaluated the significance of these data by comparing the cancer rates for company employees with the rates for other reference groups at the national and local levels; they also compared individual Du Pont plants with the average for the entire company. Most of these comparisons showed less cancer among company employees than among the reference groups, a finding whose significance was later disputed by the critics. In cases where Du Pont employees exceeded the reference group for any particular kind of cancer, company statisticians generally attributed the difference to factors other than the work environment.

As it submitted its documents to Maguire's subcommittee, Du Pont, still smarting from the tongue-lashing it received at the 28 May hearing, launched a counterattack of press releases that stressed the relatively low cancer rate among its employees. One press release noted that in the years from 1956 through

Moon's Annual Science Meeting Is Becoming a Tradition

The fifth annual International Conference on the Unity of the Sciences (ICUS), sponsored by South Korean evangelist Sun Myung Moon, came off like clockwork this year. Although Moon's name has figured in current scandals over influence peddling in this country by the South Korean Central Intelligence Agency, none of the participants appeared to have qualms about accepting the largesse of the Moon organization, which put $500,000 into the 3-day meeting, held in Washington, D.C.

Unlike last year, when several noted scientists including Kenneth Boulding and Amitai Etzioni decided as a matter of principle to withdraw from participation, there were no highly publicized defections.

There are, no doubt, many scientists who would not go to the meeting because of the sponsorship. Despite the fact that the two leading lights of the conference, Nobel laureates Sir John Eccles and Eugene P. Wigner, have distinctly right-of-center political views, politics did not intrude on the meeting which succeeded in drawing a prestigious assortment of over 400 scientists, social scientists, and philosophers.

The meeting, whose theme was "the search for absolute values," was divided into four committees: on religion and philosophy (chaired by Frederick Sontag of Pomona College); the social sciences and humanities (Morton A. Kaplan, University of Chicago); the life sciences (Brazilian sociologist Miguel Covian, who pinch-hit for the ailing British ecologist Kenneth Mellanby) and the physical sciences (Wigner).

The participants all had a marvelous time talking about the origins of life, relativity theory versus quantum theory, the fundamental rules of force, the causes of crime, and other heady things.

Milling around during the coffee breaks, the scientists expressed happiness at the opportunity to attend a multidisciplinary gathering with such high-caliber participants. David T. Carr of the Mayo Graduate School of Medicine said the opportunities for such "cross fertilization" of ideas were all too few and observed that this meeting was "very much like the AAAS meeting." None was bothered by the sponsorship, or the source of funds—said to be gathered by Moon's acolytes through their various cottage industries—which they felt was no worse than being sponsored by a big naughty corporation or a totalitarian government. After all, said one, no one has a corner on virtue and "there's a great deal of laundering of money in America."

Alan C. Nixon, former president of the American Chemical Society, said there were a few "raised eyebrows" among his friends at his attendance, but he didn't care because he was curious. The scientists enjoyed the services of hordes of clean-cut young members of Moon's Unification Church, and not even the humanists seemed bothered by the peculiar emptiness in the eyes of many Moon followers.

And with 3 days of good talk, and free food, transportation, and lodgings, who's to complain? Moon kept himself discreetly out of sight except for an opening address (whose content was dismissed by two scientists respectively, as "poppycock" and "utter nonsense") and a closing dinner. No effort was made to impose his philosophy on the deliberations, which is why scientists like his meetings better than those sponsored by another fan of science, Maharishi Mahesh Yogi, the guru of Transcendental Meditation, whose meetings are all designed to show how natural laws fit in with his "science of creative intelligence."

Although the ICUS conference prides itself on bringing together representatives from many nations, one group that was noticeably underrepresented was women. Of more than 400 names listed on the program, only 12 could be readily identified as female. Although conference secretary general Michael Young Warder explained that there just weren't that many women who had distinguished themselves in science as yet, the stag atmosphere of the whole organization is reflected in its upper hierarchies which are virtually free of women. Moon himself appears to feel that women distinguish themselves in other ways. According to a pamphlet handed out by two placard-bearing Moon opponents outside the hotel, Moon is quoted as saying "Master" needs "many good-looking girls" to educate the U.S. Senate. Three girls per senator—"one is for the election, one is to be the diplomat, one is for the party."

Moon has said a lot worse things than that, to the effect that he intends to conquer and subjugate the world. Perhaps if any of the scientists took him seriously, they would not be so quick to lend him the prestige of their presence.

A prominent participant, R. V. Jones of Aberdeen University, at one point quoted Nobel laureate Frederick Soddy to the effect that "It is priests, not religions, that it is difficult for scientific men to live with." It is a tribute to the finesse of the priest who sponsored the conference that so many notable men of science gathered under his aegis.

—C.H.

1967 death rates from cancer in the nation as a whole (adjusted for age and sex) were 20 percent greater than the death rates for Du Pont's male employees and 15 percent greater than the rate for its female employees. A second release reported that the eight Du Pont plants in Maguire's home state of New Jersey had a lower incidence of cancer than both the general U.S. population and the company as a whole. And a third release said the incidence of cancer among Du Pont's male employees in the period from 1956 through 1974 was 21 percent below the national rate. (The rate for Du Pont's females, one learned lower in the press release, was 11 percent higher than the national rate, possibly, the release suggested, because the company's regular medical examinations detect more cases earlier.)

This rather upbeat interpretation of the data was sharply disputed by Maguire and his staff on the basis of critiques prepared by expert consultants. Most of the consultants reviewed just one of the Du Pont documents—an analysis of cancer morbidity and mortality in the company between 1956 and 1967—but since this was the chief interpretive report prepared by the company up to that point, their comments go to the core of the Du Pont effort. One copy of the Du Pont document was sent to Shimkin, who seems to have been picked largely because he is the father-in-law of Elliot Segal, the subcommittee staffer in charge of Maguire's cancer investigation. Another copy was sent to the National Cancer Institute, which submitted written but unofficial comments from two experts whose names were not made public. A third went to NIOSH, whose officials commented by phone but submitted no written opinion.

The most virulent critique by far was Shimkin's. He cited a number of specific shortcomings and concluded: "The report is carefully developed, but its methodology is faulty, and its conclusions are not justified. . . . The report is too well done to attribute its errors to incompetent statistics. Therefore, it is reasonable to surmise that there was deliberate intent to mislead. I would classify it as a public relations snow job."

The Cancer Institute's analysts were not quite so harsh. A biostatistician who performed the institute's chief analysis described Du Pont's cancer register as "a step in the right direction" but warned that "limitations to the data" should be "kept in mind" when interpreting the results. His boss, in a cover letter to the analysis, concluded that the methodological limitations in Du Pont's study "would tend to underestimate the disease experience of employee populations."

A three-page report released by Congressman Maguire on 9 October summed up the indictment against Du Pont in harsh terms. "None of the three analysts who examined the Du Pont data found they could draw any useful conclusions whatsoever about cancer within the company," Maguire said. ". . . Thus, although Du Pont deserves praise for maintaining health records on its employees, and for providing them to the subcommittee, its use of these records to publicly congratulate itself on its low cancer rate is not merited, is misleading to the public and is a disservice to its workers."

Four Criticisms

Maguire's report highlighted four specific criticisms made by one or more consultants as particularly significant. All four were later rebutted or minimized by MacMahon, the company's consultant, who analyzed the entire voluminous record submitted to the subcommittee by Du Pont and submitted a nine-page "preliminary evaluation" of the material to the company on 9 November. The debate went as follows:

First, the critics complained that comparing Du Pont employees with the general population is misleading because workers are on the average healthier than the general population, hence one would expect the cancer rate for employees to be less than the rate for all citizens. That's fine, MacMahon retorted, but what is an alternative comparison group? The company has already compared its employees with the populations of Connecticut; Alameda County, California; New York State, exclusive of New York City; the Kanawha County region surrounding the Belle, W. Va. plant; and the nation as a whole. All of these comparisons have weaknesses. Du Pont acknowledges that the national work force might make a better reference population but says there are no good data available for that group.

Second, the critics complained that Du Pont used a "cross-sectional" survey of employees rather than a "cohort" analysis, which would follow a given population of workers for 20 or more years even if some of those workers left the company. "[W]ithout tracking the health histories of those who leave the company," Maguire's report asserts, "Du Pont cannot draw any conclusions about the health of its employees." That statement is "clearly false," MacMahon retorted. Moreover, while cohort studies have many advantages, it would be "virtually impractical," according to MacMahon, for a company as large as Du Pont to keep track of all its former employees. Du Pont does do cohort studies on workers who have been exposed to chemicals that might later be indicted as carcinogens, such as a current study of workers exposed to chloroprene.

Third, the critics charged that Du Pont's exclusion from its main cancer tables of 339 cases of urinary bladder cancer that occurred after exposure to two carcinogens at a New Jersey plant is misleading. The company has long acknowledged that those cancers were work-related; it said so in its recent press releases and documents submitted to the subcommittee. But it decided to exclude the bladder cancers from the tables lest they mask other possible work-related cancers.

Finally, one critic lamented that Du Pont's reports only subdivided employees into "wage roll" and "salaried" categories and did not further identify jobs or work areas to determine whether cancer was related to any specific hazardous job. MacMahon concluded that the Du Pont breakdown provides some useful information, but that further breakdown possibilities should be explored.

A special analysis prepared by Du Pont of cancer at the Belle plant also came under fire at a hearing held by the subcommittee on 20 September. That analysis revealed that cancer rates at the Belle plant were worse than the company average and the national cancer morbidity rate, but better than the cancer death rate in the surrounding Kanawha County. The analysis revealed a significant excess of eye and kidney cancer at the Belle plant, and possibly lung cancer as well. But Du Pont said it is not known whether the cancers were work-related or resulted from other factors or chance. John F. Finklea, director of NIOSH, cited several "methodological shortcomings" in Du Pont's Belle study, "most of which would tend to minimize or obscure the real cancer risk."

Much of debate over the Du Pont statistics stems from differing estimates of the significance of failing to follow workers who quit the company and move on. Du Pont officials have said that it's not clear how the company's cancer rate would be affected if the departees were included—that would depend on the incidence of cancer in that group. MacMahon speculated on the basis of various bits of evidence that the effect of excluding the departees is "small." But Joseph K. Wagoner, chief of NIOSH industry studies, cites an English study which

found that the risk of lung cancer was much higher among those who left the vinyl chloride industry than among those who remained in it as evidence that "without using the terminated employees, one would tend to underestimate the risk or miss the risk."

The fracas with Maguire has left Du Pont officials miffed. "We were trying to do the right thing and we took some lumps for it," Richard E. Heckert, a senior vice president, told a recent seminar for science writers that was hosted by Du Pont in an effort, in part, to overcome the bad press Du Pont thought it was getting. "Our cancer study dates back 20 years," Heckert added. ". . . it's only by judging with 1976 standards and expectations that one finds our approach to be deficient."

Bruce W. Karrh, Du Pont's assistant medical director, notes that most of the weaknesses in Du Pont's methodology were pointed out by the company itself in its own analyses. He adds that Du Pont compiled its cancer registry for 20 years without making a big splash about it and only turned it over to the subcommittee under threat of subpoena. "Had we wanted to do a public relations snow job, we could have done it for 20 years," he says. "We feel we've acted responsibly and in good faith. We have nothing to hide. People have been very free with their criticism but no one has come back with any suggestions as to what we should do."

Perhaps the chief lesson to emerge from the fracas is that it is difficult even for a sophisticated, relatively enlightened corporation such as Du Pont to measure the health effects of exposure to chemicals in the work place. It seems clear that the failure to measure the health of workers who have left the company could, at least potentially, bias the statistics and mask a possible health problem. But it is by no means clear—either to the company, the subcommittee staff, or other observers—who, if anyone, should accept the responsibility for keeping track of those former employees. Some think the federal government should establish a master registry to follow employees as they move through various work places with varying exposures to carcinogens. But whether that is feasible or desirable is a matter that has received little sustained thought. The subcommittee may focus on the tracking problem as it delves further into the issue of occupationally caused cancers.

—PHILIP M. BOFFEY

Solar Politics: Lame-Duck Officials Initiate a Major New Study

Only months before the start of a new Administration that is expected to favor solar energy development, one of the top officials of the Energy Research and Development Administration (ERDA) has called into question the economic feasibility of direct solar electric power generation on a large scale and asked for an immediate study of the issue.

The proposed study is meeting strong criticism from proponents of solar energy on Capitol Hill and from environmental and public interest groups. The critics fear that the study may be used to keep future funding for this alternative energy source at a low level compared with that for development of coal, nuclear power, and nuclear fusion. While the 22-month-old agency has labored to create a different image from that of its predecessor, the Atomic Energy Commission, the critics see in the circumstances of the study—including the reported near-firing of one ERDA employee—evidence of a continuing organizational bias in favor of nuclear power.

The official requesting a reevaluation of solar electric power is Robert L. Hirsch, ERDA's assistant administrator in charge of the development of solar, geothermal, and nuclear fusion systems. He wants a review to determine whether the solar R & D funds, which have burgeoned from almost nothing in 1970 to $115 million in fiscal 1976, should be distributed differently among the various solar options. Hirsch tends to be pessimistic about systems that would convert sunlight directly into electricity, but more sanguine about those that would derive energy from the indirect effects of the sun, such as plant growth (or biomass), wind, and ocean temperature differences. Many of these are "technologically immature" in his view, and could be hurt by too rapid program growth. (Solar energy systems for heating and cooling are technically advanced, in his view, and do not need further review.) He particularly questions the "ultimate economics" of the two types of solar-electric systems to which most of ERDA's research money is now devoted, namely photovoltaic systems and systems that would employ fields of solar collectors to focus sunlight onto a central boiler or "power tower."

Speaking at a little-noticed public meeting on 6 October, Hirsch called for a "blue ribbon" panel to address these questions and make recommendations for the solar program. Although the request was made in October, planning for the study did not get under way until after the presidential election in November, when ERDA's general advisory committee, which had been asked to oversee the study, began looking for someone to direct it. By that time, Gerald Ford had lost the election, and Hirsch, who is one of eight presidential appointees at ERDA, found himself in the awkward position of possibly being a lame-duck administrator trying to influence solar policy for many years in the future.

Congressional and public interest groups, already suspicious of ERDA's intentions because of the agency's caution in funding solar research, apparently found out about the study from a report in an energy-trade newsletter. Representative Leo Ryan (D–Calif.), who is chairman of the energy subcommittee of the recently rejuvenated House Government Operations Committee, called the study "unnecessary and duplicative," saying that the initiation of such a study at this time "is most unwise and could hardly be more untimely." Ryan and other solar energy supporters in the Congress regard the study as a device to change the direction of solar energy development laid down by the Congress, which wants a broadly based solar program pursued with all possible speed. To that end, it appropriated $290 million in the budget for fiscal 1977, whereas ERDA only asked for $160 million. One observer on Capitol Hill characterizes the new study as an attempt to "swim uphill against the will of the Congress." Another observer notes that it is "presumptuous" for ERDA to mount a major study at this time